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Probably every careful botanist would be able to relate similar experiences.—J. W. CHICKERING, JR. *Washington*.

MOOSEWOOD FIBRE.—At a recent meeting of the California Academy of Sciences, Dr. A. Kellogg presented specimens of the bark of a shrub *Dirca palustris* (Moosewood) of stronger fibre than any hitherto known, obtainable in this vicinity by tons and in the valley of the Mississippi by millions of tons.

The bark presented was in the crude condition as it came from the Ramie machine. The entire shrub, wood and bark, is suitable to work into fine quality of paper.

If desirable to separate the bark, it is done in the easiest manner possible. On the State University grounds may be seen a tree four and one-half to five inches in diameter. Mixed with silk the fibre is superior to Ramie. Even for coarse fabrics it may prove a substitute for jute, of which a very large amount is annually imported into the Southern States for baling cotton. The tree is familiar to us as Moosewood, but has not heretofore been brought forward, so far as we are aware, as material for paper.

OBIONE SUCKLEYANA TORREY.—In our Colorado collections last year we find this plant, perhaps the first time gathered so far north.—THOMAS MEEHAN.

BOTANICAL NOTABILIA.—E. A. Thompson of North Woburn announces a wild double-flowered state of *Saxifraga Virginensis*. We have heard of this in only one instance before. Rev. N. Coleman finds at Grand Rapids, Michigan, a *Trillium grandiflorum* "with six sepals and fifteen petals, all green." This *chlorosis* monstrosity occurs occasionally, but we have never seen so many floral leaves. Also *Ranunculus Purshii* with leaves all dissected although the plants were strictly terrestrial, rooted in merely moist ground.

CORRECTION.—In my remarks, in the last number, on *Quercus alba* var. *Gunnisonii*, I wrote, "some of the trees have the bark of *Q. alba*," not none of the trees, as was printed.—THOS. MEEHAN.

ZOOLOGY.

THE GREGARIOUS RAT OF TEXAS (*Sigmodon Berlandierii*).—This is a burrowing, gregarious rat, and like the Prairie dog lives

in towns on the prairie. They dwell together in families. They prefer light sandy soil on the prairie, where the shivered limy sandstone crops out, but when the prairie is enclosed and cultivated, they take possession of the fencing, and burrowing under the bottom rail, excavate sufficient cells and construct their copious grassy beds there. Out on the prairie, in the wild state, they make one principal burrow, in front of which they pile up the earth that comes from all their subterranean galleries. They rarely extend their main burrow more than eight or nine inches in depth, while their underground passages are seldom more than four or five inches below the surface. They also construct several secret outlets, opening ten or twelve inches from the main hole, which opening they very ingeniously conceal by strewing a few grass blades over it; and so, when the rat hunter attacks the citadel the inmates escape through some of the concealed passages. Eight or nine inches deep and turned a little to one side in the main hole, is a cavity seven or eight inches in diameter, filled with fine, soft grass blades, which must be quite warm and pleasant, serving the family for winter quarters. During the hot months, they construct nice grass beds in a basinlike cavity, which they dig out, under the sides of large tufts of grass, or little heaps of brush. The above is about the average customs of the distinct families in reference to the manner of making their homes, and in the same district, in suitable soil, they construct many such family residences, and cut out very nice, clean roads from one to another in all directions. The grass, weeds, dewberry briars and everything in the way, are cut out and carried away leaving the road about two inches wide, underrunning the grass and other rank growths that may fall in the way. I have traced some of these roads fifty or sixty yards, upon which there had been so much labor expended that it could not have been the result of individual enterprise. These roads, which bear the indications of much travel, are evidently the results of a unanimous governmental effort. They are found universally in their cities, and passing from house to house there are many cross roads.

This Rat has a large thick head, nothing remarkable about the mouth and nose, eyes full, black and lustrous, ears half of an inch high and nearly circular; neck very short, body short and large; tail three and three-fourths inches long, clothed with very short, thick set hair; feet with five toes, nails strong. No cheek pouches;

no grooves about the incisors, not very long hairs or "smellers" on the nose. Coloration a brownish gray. — G. LINCECUM, *Long Point, Texas*.— *Communicated by the Smithsonian Institution*.

NOTES ON CEMIOSTOMA. — I desire to correct a statement made by Mr. Mann in the June number of the *NATURALIST*, p. 339, viz., that *Cemiostoma coffeellum* is "the only species of *Cemiostoma* which is known outside of the limits of Europe."

This is a mistake. In the "Transactions of the London Entomological Society," Ser. 2, Vol. v, pp. 21 and 27, and in Ser. 3, Vol. ii, p. 101, certainly two, and if my memory is not at fault, three species, are described from India, and in Vol. iii, p. 23, of the "Canadian Entomologist," I have described a species, as *C. albella*, which I had then found mining the leaves of poplar trees (*Populus alba*, *P. dilatata* and *P. monilifera*). Since then I have found it also mining the leaves of willows (*Salix alba* and *S. Babylonica*). It resembles *C. susinella* very closely and as *Susinella* mines the leaves of *P. tremuloides* in Europe, I shall not be surprised if it proves to be that species. It would be difficult, if not impossible, now to ascertain the original food plant of *C. susinella* (if *albella* is identical with it). But it would not be very surprising if it fed on the weeping willow, and has followed its migrations from a time perhaps anterior to that when the Hebrews hung their harps upon the willows by the rivers of Babylon.

If therefore *C. albella* is only a synonyme of *C. susinella*, it is a European or Asiatic species. And judging from the food plant, *C. coffeellum* is also an Asiatic (or African?) species. It would thus seem that we have as yet no indigenous species of *Cemiostoma*.

Mr. Stainton, Dr. Clemens and others, mention a "spring brood," a "fall brood," etc., of *Microlepidoptera*. At page 184 of Vol. iii, *Can. Ent.*, I have stated as the result of my observations that the *Lithocalletidæ* (in which family I would include *Lithocalletis*, *Leucanthiza*, *Philocnistis*, *Cemiostoma*, *Tischeria*, and perhaps *Lyonetia*) continue to propagate their species as long as the weather remains warm enough: so that the number of generations in a year is (subject to the length of time passed by each species as larva, pupa and imago) a mere question of climate, and that the different generations overlap each other so that there is no such thing as separating them into distinct broods. This is likewise true of some species of *Gracillaria*. I do not know how it is

as to *Lyonetia* of which we have but one species described by Dr. Clemens from a single captured imago. But I am glad to see that Mr. Mann's observations as to the number of broods of *C. coffeolum*, confirm mine as to the *Lithocallitidæ* generally.

Mr. Mann writes the termination of the specific names of the *Tineina*, *ellum* instead of *ella*. As a matter of grammatical purity this may be well enough, but the termination *ella* has been so universally adopted, and in use so long that it is too late now to change it, and as a matter of convenience it had better be retained.—V. T. C., Covington, Ky.

THE RATTLE OF THE RATTLESNAKE.—Being interested in the controversy now in progress in the pages of the NATURALIST relative to the use of the caudal appendage of the rattlesnake, and knowing that all the facts concerning it must be duly considered before any definite conclusion can be arrived at, I have presumed to proffer my mite and suggest some inquiries, the consideration of which may throw some light on the subject.

All movements of the animal are accompanied by the peculiar sound; at least, such is my observation and I have had ample opportunities for observing. The more forcible or vigorous the movement the louder the rattle. When moving through tall stiff grass the sound emitted is much louder than when the movements are not so retarded. This peculiarity I noticed two years ago when on the frontier in this state. One day while sitting in the door of my tent, a large rattlesnake appeared on the *tramped ground* in front. He seemed to be moving "leisurely" across, his movements being attended with a "gentle" rattle. After watching him about two-thirds the way across the tramped ground, I started toward him, when he increased his speed and the rattling sound correspondingly increased in frequency and character.

Inquiry A. Is the rattling produced by vital or mechanical means? The increased rattling when the movements are retarded would seem to indicate the latter. The rattle of the dead animal when moved, emits the same peculiar sound, or shaking the rattle in the closed hand is attended with a like result, the sound being somewhat muffled in character, dependent upon being conveyed through the hand. The greater the number of segments in the rattle the greater the sound; the larger ones emitting the louder sound but being of a lesser pitch than the smaller ones.

Inquiry B. Does the fact of the increase of the number of segments with the age of the animal militate or substantiate the theory of "Natural Selection" as applied to the phenomena? The older the animal the louder the rattle. It seems to me that this fact tends to disprove the mimetic claim of Prof. Shaler and the "self-protective" feature of Mr. Henderson. Both of these features, Mimicry and Protection, may be included, but neither, nor both combined, will account for the whole of the phenomena, in relation to this fact—the young requiring greater facilities for obtaining food and more extensive measures for protection. — T. W. DEERING, *Leavenworth, Kansas.*

VENOMOUS FISH.—It is generally known that the wounds inflicted by the weevers (*Trachinus*) of our coasts, and by the sting-rays, are rendered poisonous by a mucous excretion adhering to the spines of the head, back, and tail of these fishes; and a most perfect poison-organ, analogous to the poison-fang of snakes, was described some years ago by Dr. Günther in two fishes (*Thalassophryne*) from Central America. Dr. Le Juge has found at the Mauritius another still more dangerous kind of venomous fish; it was long known to ichthyologists under the name of *Synanceia verrucosa*, and is readily recognized by its monstrous appearance, the head being deeply pitted, and the body scaleless and covered with warts. It is by no means scarce, being found throughout the Indian Ocean, and known at the Mauritius as the "Laffe." There are thirteen spines in the dorsal fin, each provided at its base with a bag containing the poison, and with a pair of deep grooves along which the poison is guided to the wound. As in all the other fishes of this kind, the poison-apparatus is merely a weapon of defence, and comes into action when the fish is seized or trodden upon. The action of fish-poison upon the human organism appears to be less rapid than that of snakes; though patients who neglect to apply remedies similar to those used for snake-bites expose themselves to serious consequences, which may terminate even fatally. In one case a fisherman died on the third day from a severe wound. Dr. Le Juge mentions that the fishermen of Mauritius successfully apply poultices of the leaves of a composite plant, *Microrhynchus sarmentosus*. (*Transact. R. Soc. of Arts and Sciences of Mauritius*, 1871.)—*Academy.*

VITALITY OF REPTILES.—I wish to draw your attention to some experiments by the Rev. William Buckland, as well on account of

their interest as to prevent their needless repetition. I do not recollect where I found the account of them, but I give the substance from memory. Twelve frogs were carefully weighed and placed in holes drilled in limestone, and the holes were covered with glass lids, cemented with clay, and the glass protected by slate, also cemented with clay. Twelve were treated in the same way in a block of compact sandstone, and another lot were placed in holes drilled in the trunks of trees. At the end of a year they were examined. Those in the wood were dead and partly decayed, as were those in the sandstone. About half of those in limestone were living and of these all but two had lost weight; and two had increased in weight. The cement closing the cell of one of these was cracked so that small insects may have found their way into it, and served as food; and although no crack could be found in the cell of the second it was probably fed in the same way, as in a third cell, also without any discoverable crack, in which the frog was dead, several small insects were found. The living frogs were closed up again, and at the end of the second year, all were dead. The frogs were examined frequently, during their confinement, by removing the slate without disturbing the glass, and in all cases the living ones were found not torpid, but awake and active. — W. K. BROOKS, *Suspension Bridge*, N. Y.

CHANGE OF TEMPERATURE IN WATER CONTAINING RECENTLY FERTILIZED SHAD EGGS.—In the September number of the NATURALIST, 1871, the question was asked, "Can any one give us an explanation of the *fact* " that, as reported by A. S. Collins, when shad eggs swell after impregnation, the water in the pan becomes about 10° colder?" Such a fact requires, of course, careful and repeated observation to establish it. But, in connection with it, the following (from "Nature," January 18, 1872) has some interest. At the Academy of Sciences, Paris, January 2d, "a note on the heat absorbed during incubation, by M. A. Moitessier, was communicated by M. Balard. The author finds that the specific heat of fecundated is less than that of unfecundated eggs when treated in the same manner, and infers that a portion of the heat absorbed by the former during incubation is transformed."

According to the recognized use of the term "specific heat," it is obvious that this statement should have been, that the specific heat of fecundated eggs is *greater* than that of unfecundated ones; as heat is said to be *absorbed* by the former. The trans-

formation, however, which is referred to, is exactly what occurred, to the mind of the writer, upon reading the item concerning shad eggs; but he was diffident about expressing it, until meeting with the above confirmation, both of the fact and of the explanation. There are few cases more satisfactory, in favor of the correlation between life-force (growth-force, bioplastic force) and the other physical forces, than heat. — H. HARTSHORNE, *Philadelphia*.

ANOTHER NOTE ON THE SAME.—My idea is that germination in the seed of plants requires heat, so does the impregnation of the eggs named. Hence the absorption, so to speak, of the heat from the water. We all know that conception in the animal requires heat, making the conclusion above obvious. — N. COLEMAN, *Otsego, Michigan*.

NEST AND EGGS OF HELMINTHOPHAGA LUCIÆ.—This interesting little bird was discovered in Arizona, and first described, by Dr. Cooper (Proc. Cal. Acad. 1862, 11, 120) and afterward written about by the same gentleman (B. of Cal. 84), by Baird (Rev. 178) and by ourselves (Ibis, 1866, 260; Proc. Phila. Acad. 1866, 70); this is its record, up to date, the nest and eggs remaining unknown. Lieut. Charles Bendire, U.S.A., writing to us from his camp near Tucson, Arizona, May 19, 1872, says: "I found to-day the nest of a very small warbler, four inches long, which has a bright chestnut spot on the crown, and the tail coverts of the same color, the other upper parts cinereous, the lower parts dull white. I cannot find it in Baird's work. The eggs, four in number, are nearly globular in shape, and hardly larger than those of a hummingbird, white, with fine red spots on the larger end. I am afraid I shall be unable to save them, as they contain large embryos. The nest was placed between the bark and main wood of a dead mezquite tree, about four feet from the ground." — ELLIOTT COUES.

OCCURRENCE OF COUCH'S FLYCATCHER IN THE UNITED STATES. The same valued correspondent speaks of finding this bird near Tucson; it has not, I believe, been hitherto taken north of Mexico. It is a slight northerly variety of the *Tyrannus melancholicus*, a species of wide distribution in Central and South America. — ELLIOTT COUES.

THE FOOD OF THE BLACK BEAR.—A few days ago I secured

for the museum of this college a fine specimen of the Black Bear (*Ursus Americanus*) caught in the neighboring town of Pownal, Vermont. In his stomach there was not, apparently, a particle of animal food, but that organ was well filled with vegetable substances, the stalks and corms of the Indian Turnip (*Arisœma triphyllum*) being among the most abundant. The bear was very fat, but whether his excellent condition was brought about wholly by vegetable food is not known. — SANBORN TENNEY, *Williams College*, June 12, 1872.

A NEW LOCALITY FOR *Zonites cellarius* Müller. Living specimens of this imported species were received by me, last fall, from Mr. Samuel Powel, of Newport, R. I. They were found by Mr. David Coggeshall in his cellar. As is well known, the species has already been detected in almost every seaport, from New York to Halifax. — W. G. BINNEY.

THE BLIND CRAYFISH.—In the last number of the NATURALIST, p. 410, Prof. Cope proposes the genus *Orconectes* for the *Cambarus pellucidus* of the Mammoth Cave and his supposed new species from the Wyandotte Cave, “on account of the absence of visual organs,” and states that “Dr. Hagen’s view [in regarding the species as a *Cambarus*] may be the result of the objections which formerly prevailed against distinguishing either species or genera whose characters might be suspected of having been derived from others by modification, or assumed in descent. The prevailing views in favor of evolution will remove this objection.”

My objection to the separation of *Cambarus pellucidus* from the other species of the genus simply because the eyes were rudimentary, was based on the fact that there are known cave insects, as for instance the genus *Machaerites* with seven species, in which the females are blind, while the males have well developed eyes. I did not mention the fact in my monograph because its discovery was nearly ten years old, often mentioned and well known by those who have studied the cave insects.

Would Prof. Cope have the cruelty to separate husband and wife so far as to put them in different genera because one of them is blind and the other not? If the prevailing views in favor of evolution demand such a separation, would it not be more human, and perhaps more courteous to the feminine sex, to wait a little while until the poor males shall be able to follow their more

advanced wives? It is rather hard for Nature to follow, or even compete, with the fast driving of the evolutionary disciples, but as she is after all a very good natured old lady I have no doubt she will do her best not to stay too far behind the prevailing views of evolution.

Concerning the new species, "*O. inermis*," the description of the single specimen does not give any character by which to separate it from the old species, *C. pellucidus*. I have not seen Prof. Cope's type, and, though he states that his specimen is a male, he omits to inform us to which of the two forms of males it belongs, but his description applies perhaps to the second form of the male, the characters of which are always less marked than in the first.—DR. H. HAGEN.

G E O L O G Y .

NEW AND REMARKABLE FOSSILS.—We copy from the "College Courant" the following summary of the latest published results of Prof. Marsh's expeditions to the West;—The extensive collection of fossil vertebrate remains which were made in the West by the Yale expeditions of 1870 and 1871, are yielding, in the hands of Professor Marsh, results of the greatest value to palæontological science. Ten important papers upon the new material thus obtained have already been contributed by "this indefatigable palæontologist" to the "American Journal of Science," the last three of which relate exclusively to the collections of 1871. The first of these later papers, published in April, contains a description of some Pterosaurian remains, additional to those discovered by the expedition of 1870, of which an account was published about a year ago. To the gigantic species of pterodactyl then obtained, Professor Marsh gave the name *Pterodactylus occidentalis*. The expedition of 1871, in exploring the original locality in Western Kansas, not only obtained further portions of the same skeleton, but secured other specimens which prove the existence of two other gigantic pterodactyls during the later Cretaceous. The characters of *Pterodactylus occidentalis* are derived from the study of portions of five individuals. They show clearly that the species belongs to the short-tailed or true Pterodactyls, and that it contains some of the largest "flying dragons" yet discovered, the spread of wing in these individuals